



Finishing in Style... Bindery Operations

“It’s the little things that count, hundreds of ’em.”

Cliff Shaw

There is one department in our printing company that you don’t often hear about... our bindery. This is where we take printed sheets to finish the job. There are often many small operations that need to be completed just before the job is ready to be delivered. Even though they are frequently rather small and seemingly insignificant operations, together they combine to insure that the final product has a very professional appearance.

The bindery in our company is where we create the final product from flat press sheets; products like a folded brochure, a booklet, a pad, a numbered invoice, pages with holes ready for a ring binder, a spiral bound manual, or a ticket with perforations to make a tear-off stub. The bindery is where we trim business cards to final size and trim the edges of booklets to make them even. It’s where we apply the glue that makes individual sheets of carbonless paper into a set. It’s also here that we package the order and do the final quality control check. So even though we rarely mention the bindery when talking to you about a project, it is a very important part of the printing process.

Bindery Equipment

Almost all bindery functions can be performed in one of three ways: by hand (meaning the work is done manually without the aid of machines); with machines after printing is complete (also called *offline*); and with machines in conjunction with printing (also called *inline*). Most inline bindery functions are performed by digital printers which can collate, fold, staple, or make booklets in the same operation with the copying. When the machines are operating at top speed, it is fascinating to watch – the machine operator loads sheets of paper at one end of the machine, and unloads completed materials at the delivery end.

Our standalone or offline bindery equipment offers more to the job than just greater speed. All of the equipment



produces a superior completed product when compared to a manual operation, such as you might perform in your office. Taken a single sheet at a time, paper is fairly easy to manipulate manually. But create a stack of paper, and the conditions change dramatically.

For example, although it is easy to cut a single sheet of paper with scissors, a stack of paper needs to be cut by a blade. Our precision cutter not only has a blade, it also has a clamp to hold the stack (called a *lift*) in place while the cut is made. And the knife does not drop straight down; instead, it drops at an angle like a guillotine, smoothly slicing its way through the stack of paper.

Our folder is another example of producing a superior product. The folds are made when the sheet of paper is forced against a plate where it *buckles*, then goes through rollers to flatten the fold. This process creates the tight fold characteristic of a mechanical fold and is nearly impossible to duplicate manually. In addition, the feed mechanism on the folder sends each sheet into the machine in precisely the same way, without skew and at evenly spaced intervals. The result is a consistently perfect fold no matter how fast the machine is running.

Allowing for Bindery Operations

You will get the best results for your project if you understand that some bindery functions require an adjustment to the layout of the document file. The three most common are allowances for trimming, folding, and document binding.

Trimming

If your document contains a *bleed* – an image or line or solid color that extends all the way to the edge of the sheet – the layout will need to be adjusted. This is because we can't print an image to the edge of the sheet. What looks like printing to the edge is really a printed image that has been extended past the final size, then trimmed to the final size. The standard allowance for a bleed is 1/8 inch (0.125) beyond the finished size. So if the final size of your printed product is 8.5 x 11, then set the document size at 8.75 x 11.25, set trim marks at 8.5 x 11, and extend the image that will bleed 0.125 inches past the trim lines.

Folding

When you are preparing a document like a tri-fold brochure, remember that the size of panels that fold in must be slightly smaller to produce a completely flat and even fold. The adjustment is particularly critical when the image from one panel abuts the image from an adjacent panel. To compute the adjustment mathematically, determine the width of a single panel as if all were the same size, reduce the width of the panel that folds in by at least 1/8 inch (or more, depending on the thickness of the paper being used for the job), divide by two, and add that amount to each of the outside panels. Here's an example:

8.5 x 11 sheet of paper folded in thirds to produce a brochure measuring 8.5 x 3.67 after folding.

- 11 divided by 3 = 3.667 – the width of a panel if all were equal
- To determine the width of the inner panel, subtract 0.125 (1/8 inch) from 3.667 = 3.542
- To determine the width of the outer panels, divide 0.125 by 2 = 0.063. Add this amount to 3.667 = 3.73
- Result: the panel that folds in (the inner panel) has a width = 3.54; the two outer panels have a width of 3.73

Remember that the position of the inside panel changes from the front to the reverse. In the example above, the inner panel moves from the left to the right depending on whether you are working on the outside or inside of the finished brochure. To see this easily, fold an 8.5 x 11 sheet of paper in thirds, make a mark on both sides of the inner panel, then unfold.

Drilling/Punching

To put holes in paper, we may use a spindle drill (similar to a wood drill) or a punch (inline on the digital printer or for mechanical binding such as plastic comb or coil). When you are setting the margins for an item that will be drilled or punched, you must allow extra space from the edge of the sheet to where the image begins to accommodate the drill or punch pattern. A half inch clear space is recommended for an 8.5 x 11 sheet, so shift the margin to the right for one-sided pages. For two-sided pages, shift right for odd-numbered and left for even-numbered pages.

Booklet-making

Booklets consisting of more than two or three flat press sheets before being made into the booklet can present a problem known as *shingling* or *page creep*. To illustrate page creep, fold ten sheets of paper in half. Gather them into a booklet and examine the booklet's outer right hand edge. Notice that the pages are uneven (shingled). This is the result of page creep. To eliminate the unevenness, the final step in making a booklet is to trim the face (*i.e.*, the outer right hand edge). If there has not been an adjustment for page creep, it is possible that text, page numbers, or other images may be trimmed away during the face trim.

Making exact adjustments for page creep requires complicated mathematical computations. A less accurate though simpler method is to make a dummy booklet; fold the exact number of press sheets that will make up the booklet, gather them into a booklet, and stitch (staple) in the center fold. Make the face trim, then disassemble the booklet. Measure the width of the inner-most sheet (the one that will have the center spread), and set page margins accordingly.

Do it yourself or ask us for help

The instructions we've given to adjust for trimming, folding, and mechanical binding are standards in the printing industry, so they are worth learning. However, if the software program you are using doesn't have the tools to make the adjustments easily, then we suggest you let us do it for you.

To schedule an appointment call 513-248-2121.

a vocabulary of the graphic arts

worlds

Against the grain: folding paper at right angles to the grain direction. Results in broken paper fibers and a rougher finish to the fold than when folding with the grain.

Bleed: an additional amount of an image that extends beyond the edge of the page.

Crop: to eliminate portions of the image, usually on a photograph. Often indicated by crop marks that print on the press sheet.

Finished size: the exact dimension of the printed piece when trimmed and folded.

Flat size: the exact dimension of the document or page after trimming but before folding. The flat size dimension always includes compensation for folding.

Folding dummy: a sheet or sheets assembled and folded to finished size.

FPO: an acronym for *for position only*. A low resolution image placed in a document, to be replaced before printing with a high-resolution version.

Hand fold: folding styles that must be done partially or completely by hand. A hand fold can follow a mechanical fold.

Imposition: in booklet or book making, the placement of pages in a signature so that after printing, folding, and

cutting the pages will appear in proper sequence.

Mechanical binding: holding pages together by stitching, plastic comb, plastic or wire spiral, stitching with tape binding, or other means.

Mechanical fold: a fold that can be made with a folding machine.

Paper grain: the orientation of paper fibers. During papermaking, most fibers line up with their length parallel to that of the paper making machine.

Saddle stitching: applying one or more staples in the fold of a booklet.

Shingling: in image assembly and layouts, the center or gutter margin that is adjusted according to the position of the page in the signature and the bulk of the paper.

Signature: in booklet or book making, a group of pages on a single press sheet that have been positioned so that after printing, folding, and binding, the pages appear in proper sequence. Placement of pages in a signature is determined by using a folding dummy.

Spread: two pages meant to be viewed as one.

Trim marks: marks placed on the copy to indicate the edge of the page or image.

T H E I D E A

Plan for Bindery Makeready

All bindery operations require a certain number of press sheets as *setups* or *makeready*. The more bindery functions a specific job requires, the more extra press sheets must be printed to allow for makeready in each operation. Please remember this when you are supplying your own paper for a job. Ask us for guidelines or better yet, let us specify the quantity before you place the paper order.

Of all the equipment in our shop, the bindery machines are the least accurate when it comes

to holding a tolerance. Whereas our presses can register to 0.010 inch, our folder and cutter are limited to a tolerance of 1/32 of an inch. In addition, our bindery equipment can't always be operated at speeds that match the press, in part because the tolerance limitations force the operator to slow down. This means we have to allow sufficient time for bindery – and in our shop this typically means one day for each bindery operation.

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TRICKS & tips

Folding with the Grain

A fold will be smoother and more resilient when the grain of the paper is parallel to the fold. *Paper grain* is the direction of the wood fibers on the sheet. Paper folds smoothly with the grain and roughens or cracks against the grain (also called *cross grain*). Paper is also stiffer in the grain direction and expands or contracts more in the cross direction when exposed to moisture.

As a rule, we print on the sheet so that folds will be with the grain. When this is not possible, we *score* the paper fibers to break them evenly before folding. Scoring is usually necessary for all cover weight papers, for some text weight papers, and when an area of heavy ink coverage crosses through a fold or color break.



I was in your shop the day my brochure was on press. Why do I have to wait two more days for the job to be complete?



One of the important rules of bindery is not to handle wet press sheets. After your brochure was printed, we put it on a drying rack to allow the ink to dry thoroughly. The next day we were able to cut down the press sheets, fold, and trim without risking the ink smearing or cracking. Then your brochures were packaged and considered ready for delivery. Our policy is to have jobs completely finished, packaged, and ready for presentation to you on the agreed-upon due date.

We perform most bindery functions in-house, but we also use the services of a *trade bindery* when we lack the proper equipment or if the job quantity makes it too time consuming to do here. In this case, we may need even more time for bindery – we will factor that in when we commit to a delivery date.

questions and answers